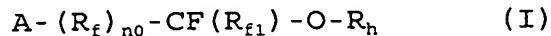


CLAIMS

1. Process for obtaining hydrofluoroethers of formula (I):



wherein:

n_0 is zero or 1;

R_f is a bivalent radical:

$C_1 - C_{20}$, preferably $C_2 - C_{12}$, linear or branched

(per)fluoroalkylene, optionally containing one or more oxygen atoms;

$-CFW'O - (R_{f2}) - CFW-$, wherein W and W', equal or different, are F, CF_3 ; R_{f2} is a (per)fluoropolyoxyalkylene containing one or more of the following units, statistically distributed along the chain, (C_3F_6O) ; $(CFWO)$ wherein W is as above; (C_2F_4O) , $(CF_2(CF_2)_zCF_2)$ wherein z is an integer equal to 1 or 2; $(CH_2CF_2CF_2)$;

R_{f1} is F or a $C_1 - C_{10}$ linear or branched (per)fluoroalkyl or (per)fluorooxyalkyl radical;

R_h is a $C_1 - C_{20}$, preferably $C_1 - C_{10}$ linear, branched when possible, saturated or unsaturated when possible alkyl, or $C_7 - C_{20}$ alkylaryl, optionally containing heteroatoms selected from F, O, N, S, P, Cl; and/or functional groups preferably selected from $-SO_2F$, $-CH=CH_2$, $-CH_2CH=CH_2$ and NO_2 ;

A = F, $(R_{h2}O) - CF(R_{f4}) -$, $-C(O)F$, wherein

- R_{h2} , equal to or different from R_h , has the R_h meanings;
- R_{f4} , equal to or different from R_{f1} , has the R_{f1} meanings;

wherein a mono- or bifunctional carbonyl compound of formula:



wherein B is F or $-C(O)R_{f4}$, R_f , R_{f1} and R_{f4} being as above,

is reacted with at least one equivalent of a fluoroformate of formula:



wherein $R = R_h$ or R_{h2} as above;

in the presence of an ion fluoride compound (catalyst) and of a dipolar aprotic organic compound, liquid and inert under the reaction conditions.

2. A process according to claim 1, wherein the (C_3F_6O) unit of R_{f2} can be $(CF_2CF(CF_3)O)$ or $(CF(CF_3)CF_2O)$.
3. A process according to claims 1-2, wherein in formula (I) R_{f1} and R_{f4} of A, independently the one from the other, are F, CF_3 .
4. A process according to claims 1-3, wherein when R_f of formula (I) is a (per)fluoroalkylene, R_f is selected from the following groups: $-CF_2-$, $-CF_2CF_2-$, $-CF_2CF_2CF_2-$,

$-\text{CF}_2(\text{CF}_3)\text{CF}-$; when R_f contains one oxygen atom it preferably is $-\text{CF}_2(\text{OCF}_3)\text{CF}-$.

5. A process according to claims 1-3, wherein R_{f2} is a perfluoropolyoxyalkylene chain having number average molecular weight from 66 to 12,000, preferably from 100 to 5,000, more preferably from 300 to 2,000.

6. A process according to claim 5, wherein when R_{f2} is a perfluorooxyalkylene chain it is preferably selected from the following structures:

a) $-(\text{CF}_2\text{CF}_2\text{O})_m(\text{CF}_2\text{O})_n(\text{CF}_2\text{CF}(\text{CF}_3)\text{O})_p(\text{CF}(\text{CF}_3)\text{O})_q-$;

b) $-(\text{CF}_2\text{O})_n(\text{CF}_2\text{CF}(\text{CF}_3)\text{O})_p(\text{CF}(\text{CF}_3)\text{O})_q-$;

c) $-(\text{CF}_2\text{CF}_2\text{O})_m(\text{CF}_2\text{O})_n$;

wherein:

m is comprised between 0 and 100 extremes included;

n is comprised between 0 and 50 extremes included;

p is comprised between 0 and 100 extremes included;

q is comprised between 0 and 60 extremes included;

$m+n+p+q>0$ and the number average molecular weight of R_{f2} being in the above limits.

7. A process according to claim 6, wherein R_{f2} is a perfluorooxyalkylene c), and the m/n ratio ranges from 0.1 to 10, n being different from zero and the number average molecular weight comprised within the above limits.

8. A process according to claims 1-7, wherein in formula (I)

R_h and R_{h2} have the following meanings: $-CH_3$, $-CH_2CH_3$, $-CH_2CH_2CH_3$, $-CH(CH_3)_2$, $-CH_2CH=CH_2$.

9. A process according to claims 1-8, wherein the ion fluoride compound is any compound capable to generate ion fluorides when, in the presence of dipolar aprotic solvents, at temperatures from 20°C up to 200°C, said dipolar aprotic solvents being acetonitrile, dimethylformamide, glyme, ethylene polyoxides dimethylethers (PEO-dimethylethers).
10. A process according to claim 9, wherein the ion fluoride compound is selected from the group comprising metal fluorides, preferably alkaline or alkaline-earth metal fluorides; AgF; alkylammoniumfluorides, alkylphosphoniumfluorides, wherein the nitrogen and respectively the phosphor atom can be substituted with one or more C_1 - C_8 alkyl groups, equal to or different from each other.
11. A process according to claims 9-10, wherein the ion fluoride compound is CsF and KF.
12. A process according to claims 9-11, wherein the catalyst is optionally supported.
13. A process according to claims 1-12, wherein the catalyst amounts, expressed in % by moles, are in the range 0.1%-50% with respect to the mono- or bifunctional carbonyl compound of formula (IV).